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10/510,546	04/25/2005	Bernie Volz	P16816-US2	7325

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EXAMINER	
BRUCKART, BENJAMIN R	
ART UNIT	**PAPER NUMBER**
2146	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/510,546	VOLZ ET AL.	
	Examiner	Art Unit	
	BENJAMIN R. BRUCKART	2146	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *106-171* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *106-171* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 October 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20080611*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

Status of Claims:

Claims 106-171 are pending in this Office Action.

Claims 106-171 are new.

Claims 1-105 are cancelled.

The claims and only the claims form the metes and bounds of the invention. "Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, I 45-48; p 2100-9, c 1, l 1-4). The Examiner has full latitude to interpret each claim in the broadest reasonable sense. The Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

Response to Arguments

Applicant's arguments filed in the amendment filed 6/11/08, have been fully considered but are moot in view of new grounds of rejection. The reasons set forth below.

Applicant's invention as claimed:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

REMARKS

Applicant has cancelled previously pending claims and added new claims about similar subject matter but detailed towards allocation of an address.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin R. Bruckart whose telephone number is (571) 272-

3982. The examiner can normally be reached on 9:00-5:30PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Pwu can be reached on (571) 272-6798. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Benjamin R Bruckart
Examiner
Art Unit 2155

/Benjamin R Bruckart/
Examiner, Art Unit 2155

Claims 106-171 are rejected under 35 U.S.C. 103(a) as being unpatentable by U.S. Patent No. 6,892,245 by Crump et al.

Regarding claim 106, a method for supporting establishment of a requested connection between a node of an inside address realm and a node of an outside address realm through an intermediate communication gateway having a gateway address pool comprising a limited number of available outside-realm gateway addresses for enabling outside-realm representation of inside-realm nodes (Crump: col. 3, lines 29-55; Fig. 1 and Fig. 4), said method comprising the steps of:

i) providing multiplexing information including at least one of network address information and port information of at least one of said inside-realm node and said outside-realm node (Crump: col. 3, lines 32-36 and col. 18, lines 38-41);

ii) performing, prior to initiating establishment of said requested connection, network address allocation including the steps of (Crump: Fig. 4, and col. 7, lines 42-61):

selecting, from said gateway address pool, a candidate outside-realm gateway address for combination with said multiplexing information (Crump: col. 7, lines 51-55; Crump teaches finding a corresponding entry in the table or allocating a new entry),

determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection (Crump: col. 7, line 46-51; whether a NAT entry is already made mapping the address information);

iii) thereafter, initiating establishment of said requested connection based on the unique combination of outside-realm gateway address and said multiplexing information (Crump: Fig. 4, 7; col. 11, lines 59-67).

The Crump reference does not explicitly teach repeating the search for a candidate outside realm address with multiplex information.

However, Crump performs the essential steps of searching for previous entries in a NAT table and if one is not found, not then allocating a new entry with a global address from the pool of addresses in order to resolve ambiguous network address translation across multiple domains (Crump: col. 1, lines 60-62).

It would have been obvious to one of ordinary skill in the art at the time of the invention to create the invention of Crump to include repeated searching for entries as taught by Crump in order to resolve ambiguous network address translation across multiple domains (Crump: col. 1, lines 60-62).

Regarding claim 107, the method according to claim 106, wherein the unique combination of outside-realm gateway address and said multiplexing information defines an outside-realm gateway state representation that has no counterpart in a predetermined set of existing gateway connection states (Crump: Fig. 2a-2d; col. 3, line 35, 36; unique address).

Regarding claim 108, the method according to claim 107, further comprising the step of maintaining a separate list representation of said predetermined set of existing gateway connection states, and wherein said outside-realm gateway state representation is selected based on comparison with corresponding information of said gateway connection states represented in

said list representation (Crump: col. 7, lines 42-55; address translation tables).

Regarding claim 109, the method according to claim 107, wherein said multiplexing information, for an inside-realm initiated connection, includes at least one of outside node address information and outside node port information, said outside-realm gateway state representation is an at least partially complete gateway state representation, and said predetermined set of gateway connection states includes the existing gateway connection states in said gateway (Crump: Fig 2a-2d).

Regarding claim 110, the method according to claim 109, wherein said selecting step also includes selecting associated gateway port information for combination with said multiplexing information, said outside-realm representation is a complete outside-realm representation, and said step of initiating establishment of said connection comprises the step of requesting that said gateway creates a gateway connection state based on said complete outside-realm representation (Crump: Fig 2a-2c; destination port; col. 9, lines 31-34; col. 18, lines 38-41).

Regarding claim 111, the method according to claim 109, wherein said outside-realm representation is a partially complete outside-realm representation, and said step of initiating establishment of said connection comprises the step of requesting that said gateway creates a partially complete gateway connection state based on said partially complete outside-realm representation (Crump: Fig 2a-2d).

Regarding claim 112, the method according to claim 107, wherein said multiplexing information, for an outside-realm initiated connection, includes at least one of outside node address information and inside node port information, said outside-realm gateway state representation is a partially complete gateway state representation and said predetermined set of gateway connection states includes the existing partially complete gateway connection states in said gateway (Crump: col. 9, lines 31-34).

Regarding claim 113, the method according to claim 112, wherein outside-realm gateway addresses of the gateway are traversed until finding an outside-realm gateway address, which in combination with said multiplexing information has no counterpart in any existing partially complete gateway connection state (Crump: col. 7, lines 42-57).

Regarding claim 114, the method according to claim 112, wherein said step of determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for a connection comprises the step of verifying that a pre-allocated outside-realm gateway address in combination with said multiplexing information has no counterpart in any existing partially complete gateway connection state (Crump: col. 7, lines 42-57).

Regarding claim 115, the method according to claim 112, wherein said step of initiating establishment of said connection comprises the step of requesting that said gateway establishes a partially complete gateway connection state based on said partially complete outside-realm

representation (Crump: Fig. 4, 7; col. 11, lines 9-67).

Regarding claim 116, the method according to claim 115, further comprising the step of transforming, upon receipt of a packet from said outside node to said gateway, said partially complete gateway connection state that has been created in said gateway into a complete gateway connection state based on complementary connection information associated with said packet (Crump: Fig. 4, 7; col. 11, lines 59-67).

Regarding claim 117, the method according to claim 116, wherein said multiplexing information is predetermined outside node address information, and said complementary connection information includes inside node port information and outside node port information (Crump: 2a-2d).

Regarding claim 118, the method according to claim 116, wherein said multiplexing information is predetermined inside node port information, and said complementary connection information includes outside node address information and outside node port information (Crump: 2a-2d; col. 18, lines 38-41).

Regarding claim 119, the method according to claim 112, further comprising the steps of:

selecting, if it is not possible to find a unique combination based on predetermined inside node port information, another gateway port (Crump: Fig 2a-2d; col. 18, lines 38-41); and

selecting an outside-realm gateway address based on said selected gateway port to define a unique, partially complete outside-realm representation of a gateway connection state (Crump: 2a-2d; col. 18, lines 38-41).

Regarding claim 120, the method according to claim 112, wherein said multiplexing information originates from a user-resource identifier query initiated from said outside node (Crump: col. 3, lines 32-53).

Regarding claim 121, the method according to claim 107, wherein said connection establishment is based on said outside-realm gateway state representation and a corresponding inside-realm gateway state representation (Crump: col. 3, lines 32-53).

Regarding claim 122, the method according to claim 106, further comprising the steps of:

preparing, at said outside node, a user-resource identifier query that includes an inside node identifier as well as said multiplexing information including at least one of outside node address information and inside node port information (Crump: col. 11, lines 30-45);

determining inside-realm network address information based on said inside node identifier included in said identifier query (Crump: col. 11, lines 30-40);

selecting, based on said multiplexing information included in said identifier query, said outside-realm gateway address to be used in establishing a dynamic gateway connection state for a flow between said outside node and said inside node through said gateway (Crump: col. 11, lines 30-45); and

establishing said dynamic gateway connection state based on said selected outside- realm gateway address, said multiplexing information included in said identifier query and said inside-realm network address information, thereby enabling an outside-realm initiated connection (Crump: col. 11, lines 40-58).

Regarding claim 123, the method according to claim 122, wherein said step of establishing said dynamic gateway connection state comprises the steps of:

creating a partially complete gateway connection state based on said selected outside-realm gateway address, said multiplexing information included in said identifier query and said inside-realm network address information (Crump: col. 11, lines 41-48); and

upon receipt of a packet from said outside node to said gateway, transforming said partially complete gateway state into a complete gateway connection state based on complementary connection information associated with said packet (Crump: col. 12, lines 11-37).

Regarding claim 124, the method according to claim 122, wherein said step of selecting an outside-realm gateway address comprises the step of selecting an outside-realm gateway address, which in combination with said multiplexing information included in said identifier-query defines a partially complete outside-realm gateway state representation that has no counterpart in any existing partially complete gateway connection state (Crump: col. 11, lines 30-54).

Regarding claim 125, the method according to claim 124, further comprising the step of maintaining a separate list representation of existing partially complete gateway connection states, and wherein said partially complete outside-realm representation is allocated based on comparison with corresponding information of all existing partially complete gateway connection states represented in said list representation (Crump: Fig 2a-2d).

Regarding claim 126, the method according to claim 125, wherein outside-realm gateway addresses associated with said gateway are traversed until finding an outside-realm gateway address, which in combination with said multiplexing information included in said identifier query has no counterpart in any existing partially complete gateway connection state represented in said list representation (Crump: col. 11, lines 48-55).

Regarding claim 127, the method according to claim 125, wherein said step of determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for a connection comprises the step of verifying that a pre-allocated outside-realm gateway address in combination with said multiplexing information included in said identifier query has no counterpart in any existing partially complete gateway connection state represented in said list representation (Crump: col. 11, lines 48-55).

Regarding claim 128, the method according to claim 123, wherein said multiplexing information included in said identifier query is an outside network address of said outside node, and said complementary connection information for completing the gateway connection state includes a

port number of said inside node and a port number of said outside node (Crump: 2a-2d; col. 18, lines 38-41).

Regarding claim 129, the method according to claim 123, wherein said multiplexing information included in said identifier query is an inside node port number (Crump: 2a-2d; col. 18, lines 38-41), and said complementary connection information for completing the gateway connection state includes an outside network address of said outside node and a port number of said outside node (Crump: col. 11, lines 30-45).

Regarding claim 130, the method according to claim 122, further comprising the step of notifying said outside node of said selected outside-realm gateway address (Crump: col. 11, lines 54-65).

Regarding claim 131, the method according to claim 122, wherein said user-resource identifier query is a Domain Name Server (DNS) query (Crump: Fig. 4).

Regarding claim 132, the method according to claim 122, wherein said inside address realm is a private address realm and said outside address realm is a public address realm (Crump: Fig. 4, col. 3, lines 34-47).

Regarding claim 133, a device for supporting establishment of a requested connection between a node of an inside address realm and a node of an outside address realm through an intermediate communication gateway having a gateway address pool comprising a limited number of available outside-realm gateway addresses for enabling outside-realm representation of inside-realm nodes (Crump: col. 3, lines 29-55; Fig. 1 and Fig. 4), said device comprising:

i) means for providing multiplexing information including at least one of network address information and port information of at least one of said inside-realm node and said outside- realm node (Crump: col. 3, lines 32-36 and col. 18, lines 38-41);

ii) means for network address allocation, said network address allocation means being configured, prior to initiating establishment of said requested connection (Crump: Fig. 4, and col. 7, lines 42-61), for:

selecting, from said gateway address pool, a candidate outside-realm gateway address for combination with said multiplexing information (Crump: col. 7, lines 51-55; Crump teaches finding a corresponding entry in the table or allocating a new entry),

determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection (Crump: col. 7, line 46-51; whether a NAT entry is already made mapping the address information);

iii) means for initiating establishment of said requested connection based on the unique combination of outside-realm gateway address and said multiplexing information (Crump: Fig. 4, 7; col. 11, lines 59-67).

The Crump reference does not explicitly teach repeating the search for a candidate outside realm address with multiplex information.

However, Crump performs the essential steps of searching for previous entries in a NAT table and if one is not found, not then allocating a new entry with a global address from the pool of addresses in order to resolve ambiguous network address translation across multiple domains (Crump: col. 1, lines 60-62).

It would have been obvious to one of ordinary skill in the art at the time of the invention to create the invention of Crump to include repeated searching for entries as taught by Crump in order to resolve ambiguous network address translation across multiple domains (Crump: col. 1, lines 60-62).

Regarding claim 134, the device according to claim 133, wherein said network address allocation means is configured for finding a unique combination of outside-realm gateway address and said multiplexing information defining an outside-realm gateway state representation that has no counterpart in a predetermined set of existing gateway connection states.

Regarding claim 135, the device according to claim 134, further comprising means for maintaining a separate list representation of said predetermined set of existing gateway connection states, and wherein said network address allocation means is configured for finding said outside- realm gateway state representation based on comparison with corresponding information of said gateway connection states represented in said list representation.

Regarding claim 136, the device according to claim 134, wherein said multiplexing information, for an inside-realm initiated connection, includes at least one of outside node address information and outside node port information, said outside-realm gateway state representation is an at least partially complete gateway state representation, and said predetermined set of gateway connection states includes the existing gateway connection states in said gateway.

Regarding claim 137, the device according to claim 136, wherein said network address allocation means is configured for selecting also associated gateway port information for combination with said multiplexing information, said outside-realm representation is a complete outside-realm representation, and said means for initiating establishment of said connection comprises means for requesting that said gateway creates a gateway connection state based on said complete outside- realm representation.

Regarding claim 138, the device according to claim 136, wherein said outside-realm representation is a partially complete outside-realm representation, and said means for initiating establishment of said connection comprises means for requesting that said gateway creates a partially complete gateway connection state based on said partially complete outside-realm representation.

Regarding claim 139, the device according to claim 134, wherein said multiplexing information, for an outside-realm initiated connection, includes at least one of outside node address information and inside node port information, said outside-realm gateway state representation is

a partially complete gateway state representation and said predetermined set of gateway connection states includes the existing partially complete gateway connection states in said gateway.

Regarding claim 140, the device according to claim 139, wherein said network address allocation means is configured for traversing outside-realm gateway addresses of the gateway until finding an outside-realm gateway address, which in combination with said multiplexing information has no counterpart in any existing partially complete gateway connection state.

Regarding claim 141, the device according to claim 139, wherein said means for determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for a connection comprises means for verifying that a pre-allocated outside-realm gateway address in combination with said multiplexing information has no counterpart in any existing partially complete gateway connection state.

Regarding claim 142, the device according to claim 139, wherein said means for initiating establishment of said connection comprises means for requesting that said gateway establishes a partially complete gateway connection state based on said partially complete outside-realm representation.

Regarding claim 143, the device according to claim 142, further comprising means for transforming, upon receipt of a packet from said outside node to said gateway, said partially complete gateway connection state that has been created in said gateway into a complete gateway connection state based on complementary connection information associated with said packet.

Regarding claim 144, the device according to claim 143, wherein said multiplexing information is predetermined outside node address information, and said complementary connection information includes inside node port information and outside node port information.

Regarding claim 145, the device according to claim 143, wherein said multiplexing information is predetermined inside node port information, and said complementary connection information includes outside node address information and outside node port information.

Regarding claim 146, the device according to claim 139, further comprising means for selecting, if it is not possible to find a unique combination based on predetermined inside node port information, another gateway port, and means for selecting an outside-realm gateway address based on said selected gateway port to define a unique, partially complete outside-realm representation of a gateway connection state.

Regarding claim 147, the device according to claim 139, wherein said multiplexing information originates from a user-resource identifier query initiated from said outside node.

Regarding claim 148, the device according to claim 134, wherein said means for initiating establishment of said connection is configured to operate based on said outside-realm gateway state representation and a corresponding inside-realm gateway state representation.

Regarding claim 149, the device according to claim 134, further comprising:

means, responsive to a user-resource identifier query from said outside node, for determining inside-realm network address information based on an inside node identifier included in said identifier query, wherein said identifier query further includes said multiplexing information including at least one of outside node address information and inside node port information;

means for selecting, based on said multiplexing information included in said identifier query, said outside-realm gateway address to be used in establishing a dynamic gateway connection state for a flow between said outside node and said inside node through said gateway; and

means for establishing said dynamic gateway connection state based on said selected outside-realm gateway address, said multiplexing information included in said identifier query and said inside-realm network address information, thereby enabling an outside-realm initiated connection.

Regarding claim 150, the device according to claim 149, wherein said means for establishing said dynamic gateway connection state comprises:

means for creating a partially complete gateway connection state based on said selected outside-realm gateway address, said multiplexing information included in said identifier query and said inside-realm network address information; and

means for transforming, upon receipt of a packet from said outside node to said gateway, said partially complete gateway state into a complete gateway connection state based on complementary connection information associated with said packet.

Regarding claim 151, the device according to claim 149, wherein said means for selecting an outside-realm gateway address is operable for selecting an outside-realm gateway address, which in combination with said multiplexing information included in said identifier-query defines a partially complete outside-realm gateway state representation that has no counterpart in any existing partially complete gateway connection state.

Regarding claim 152, the device according to claim 151, further comprising means for maintaining a separate list representation of existing partially complete gateway connection states, and wherein said network address allocation means is configured for finding said partially complete outside-realm representation based on comparison with corresponding information of all existing partially complete gateway connection states represented in said list representation.

Regarding claim 153, the device according to claim 152, wherein said network address allocation means is configured for traversing outside-realm gateway addresses associated with said gateway until finding an outside-realm gateway address, which in combination with said multiplexing

information included in said identifier query has no counterpart in any existing partially complete gateway connection state represented in said list representation.

Regarding claim 154, the device according to claim 152, wherein said means for determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for a connection comprises means for verifying that a pre-allocated outside-realm gateway address in combination with said multiplexing information included in said identifier query has no counterpart in any existing partially complete gateway connection state represented in said list representation.

Regarding claim 155, the device according to claim 150, wherein said multiplexing information included in said identifier query is an outside network address of said outside node, and said complementary connection information for completing the gateway connection state includes a port number of said inside node and a port number of said outside node.

Regarding claim 156, the device according to claim 150, wherein said multiplexing information included in said identifier query is an inside node port number, and said complementary connection information for completing the gateway connection state includes an outside network address of said outside node and a port number of said outside node.

Regarding claim 157, the device according to claim 149, further comprising means for notifying said outside node of said selected outside-realm gateway address.

Regarding claim 158, the device according to claim 149, wherein said user-resource identifier query is a Domain Name Server (DNS) query.

Regarding claim 159, the device according to claim 149, wherein said inside address realm is a private address realm and said outside address realm is a public address realm.

Regarding claim 160, a gateway resource manager for a communication gateway that has a limited number of available outside-realm gateway addresses for enabling outside-realm representation of inside-realm nodes (Crump: col. 3, lines 29-55; Fig. 1 and Fig. 4), said gateway resource manager comprising:

i) an input configured to receive multiplexing information including at least one of network address information and port information of at least one of said inside-realm node and said outside-realm node (Crump: col. 3, lines 32-36 and col. 18, lines 38-41);

ii) network address allocation circuitry configured to perform the following tasks prior to initiating establishment of a requested connection (Crump: Fig. 4, and col. 7, lines 42-61):

select, from said outside-realm gateway addresses, a candidate outside-realm gateway address for combination with said multiplexing information (Crump: col. 7, lines 51-55; Crump teaches finding a corresponding entry in the table or allocating a new entry);

determine whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection (Crump: col. 7, line 46-51; whether a NAT entry is already made mapping the address information);

iii) resource allocation circuitry configured to initiate establishment of said requested connection based on the unique combination of outside-realm gateway address and said multiplexing information (Crump: Fig. 4, 7; col. 11, lines 59-67).

The Crump reference does not explicitly teach repeating the search for a candidate outside realm address with multiplex information.

However, Crump performs the essential steps of searching for previous entries in a NAT table and if one is not found, not then allocating a new entry with a global address from the pool of addresses in order to resolve ambiguous network address translation across multiple domains (Crump: col. 1, lines 60-62).

It would have been obvious to one of ordinary skill in the art at the time of the invention to create the invention of Crump to include repeated searching for entries as taught by Crump in order to resolve ambiguous network address translation across multiple domains (Crump: col. 1, lines 60-62).

Regarding claim 161, the gateway resource manager according to claim 160, wherein said network address allocation circuitry is configured for finding a unique combination of outside-realm gateway address and said multiplexing information defining an outside-realm gateway state representation that has no counterpart in a predetermined set of existing gateway connection states.

Regarding claim 162, the gateway resource manager according to claim 161, wherein said network address allocation circuitry is configured for finding said outside-realm gateway state representation based on comparison with corresponding information of said gateway connection states represented in a list representation of said predetermined set of existing gateway connection states.

Regarding claim 163, the gateway resource manager according to claim 161, wherein said multiplexing information, for an inside-realm initiated connection, includes at least one of outside node address information and outside node port information, said outside-realm gateway state representation is an at least partially complete gateway state representation, and said predetermined set of gateway connection states includes the existing gateway connection states in said gateway.

Regarding claim 164, the gateway resource manager according to claim 161, wherein said multiplexing information, for an outside-realm initiated connection, includes at least one of outside node address information and inside node port information, said outside-realm gateway state representation is a partially complete gateway state representation and said predetermined set of gateway connection states includes the existing partially complete gateway connection

states in said gateway.

Regarding claim 165, the gateway resource manager according to claim 161, wherein said input is configured to receive inside-realm network address information corresponding to an inside node, and multiplexing information including at least one of outside node address information and inside node port information;

said outside-realm gateway address is to be used in establishing a dynamic gateway connection state for a flow between said outside node and said inside node through said gateway; said resource allocation circuitry is configured to request said gateway to establish said dynamic gateway connection state based on said selected outside-realm gateway address, said multiplexing information and said inside-realm network address information.

Regarding claim 166, the gateway resource manager according to claim 165, wherein said multiplexing information is an outside node address, and said input is configured to request allocation of said selected outside-realm gateway address to said inside node for traffic coming from said outside node address.

Regarding claim 167, the gateway resource manager according to claim 165, wherein said input is configured to send a request to said gateway for establishment of a partially complete gateway connection state based on said selected outside-realm gateway address, said multiplexing information and said inside-realm network address information.

Regarding claim 168, the gateway resource manager according to claim 167, further comprising: means for receiving a reply from said gateway that said partially complete gateway connection state has been created; and means for notifying said outside node of said selected outside-realm gateway address in response to said reply from said gateway.

Regarding claim 169, the gateway resource manager according to claim 167, wherein said network address allocation circuitry is configured to select an outside-realm gateway address, which in combination with said multiplexing information, defines a partially complete outside-realm gateway state representation that has no counterpart in any existing partially complete gateway connection state.

Regarding claim 170, the gateway resource manager according to claim 169, further comprising means for maintaining a list representation of existing partially complete gateway connection states, and wherein said network address allocation circuitry is configured to find said partially complete outside-realm representation based on comparison with corresponding information of all existing partially complete gateway connection states represented in said list representation.

Regarding claim 171, the gateway resource manager according to claim 160, wherein said network address allocation circuitry is configured to determine whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for a connection based on comparison with established connections and/or connections under establishment.

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